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LISTING OF CLAIMS:

This listing of claims, including new claims 21-26, will replace all prior versions, and listings, of claims in the application:

Claim 1 (Currently Amended): An inverter apparatus for ~~controlling the speed of~~converting a DC power from an input AC power to an output AC power having a variable frequency and a variable electric power to drive an induction motor ~~variably~~at a variable speed, comprising:

a rectifying unit for converting an input AC power to a DC power, a filter capacitor for smoothing the DC power outputted from said rectifying unit, an inverter unit having an input connected across said filter capacitor, a motor current detector for detecting a motor current outputted from said inverter unit and a gate circuit for driving said inverter unit;

an excitation detection unit for detecting an excitation current of said induction motor from an output of said motor current detector and a reference phase command;

a setting unit for setting a limitation level of said excitation current;

a torque boost voltage command unit for producing a torque boost voltage command ~~in response~~according to ~~a~~an inverter frequency command ~~of said inverter apparatus~~; and

a torque boost voltage compensation unit for changing said torque boost voltage command so that ~~said~~the detected excitation current value is smaller than or equal to said limitation level.

Claim 2 (Currently Amended): An inverter apparatus according to Claim 1, wherein said torque boost voltage compensation unit includes a limiter processing unit, and inverts said torque boost voltage command, ~~said inverted torque boost voltage command being~~which is limiter-processed as a lower limiter value of said limiter processing unit to produce a compensation value of said torque boost voltage command.

Claims 3-4 (Canceled):

Claim 5 (Currently Amended): An inverter apparatus according to Claim 1, wherein a no-load motor current ~~(no-load current)~~ is limited substantially to an ~~approximate~~ excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is being operated in no load.

Claim 6 (Currently Amended): An inverter apparatus according to Claim 1, wherein an inverter output voltage is controlled to be substantially constant after the time when ~~that a~~ no-load motor current ~~(no-load current)~~ reaches substantially an ~~approximate~~ excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is being operated in no load.

Claim 7 (Currently Amended): An inverter apparatus according to Claim 2, wherein a no-load motor current ~~(no-load current)~~ is limited substantially to

an ~~approximate~~ excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is being operated in no load.

Claim 8 (Currently Amended): An inverter apparatus according to Claim 2, wherein an inverter output voltage is controlled to be substantially constant after the time ~~that~~when a no-load motor current ~~(no-load current)~~ reaches substantially an ~~approximate~~ excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is being operated in no load.

Claims 9-10 (Canceled):

Claim 11 (Currently Amended): An inverter apparatus for ~~controlling the speed of~~converting a DC power from an input AC power to an output AC power having a variable frequency and a variable electric power to drive an induction motor ~~variably~~at a variable speed, comprising:

rectifying means for converting an input AC power to a DC power, filter means for smoothing the DC power outputted from said rectifying means, inverter means having an input connected across said filter means, motor current detection means for detecting a motor current outputted from said inverter means, and gate drive means for driving said inverter means;

excitation current detection means for detecting an excitation current of said induction motor from an output of said motor detection means and a reference phase command;

setting means for setting a limitation level of said excitation current;

torque boost voltage command means for producing a torque boost voltage command ~~in response~~according to aan inverter frequency command ~~of said inverter apparatus~~; and

torque boost voltage compensation means for changing said torque boost voltage command so that ~~said~~the detected excitation current value is smaller than or equal to said limitation level.

Claim 12 (Currently Amended): An inverter apparatus according to Claim 11, wherein said torque boost voltage compensation means includes limiter processing means, and inverts said torque boost voltage command, ~~said inverted torque boost voltage command being~~which is limiter-processed as a lower limiter value of said limiter processing means to produce a compensation value of said torque boost voltage command.

Claims 13-14 (Canceled):

Claim 15 (Currently Amended): An inverter apparatus according to Claim 11, wherein a no-load motor current ~~(no-load current)~~ is limited substantially to an ~~approximate~~ excitation current limitation level when said torque boost voltage

command is increased gradually in the state that said induction motor is being operated in no load.

Claim 16 (Currently Amended): An inverter apparatus according to Claim 11, wherein an inverter output voltage is controlled to be substantially constant after the time ~~that~~when a no-load motor current ~~(no-load current)~~ reaches substantially an ~~approximate~~ excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is being operated in no load.

Claim 17 (Currently Amended): An inverter apparatus according to Claim 12, wherein a no-load motor current ~~(no-load current)~~ is limited substantially to an ~~approximate~~ excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is being operated in no load.

Claim 18 (Currently Amended): An inverter apparatus according to Claim 12, wherein an inverter output voltage is controlled to be substantially constant after the time ~~that~~when a no-load motor current ~~(no-load current)~~ reaches substantially an ~~approximate~~ excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is being operated in no load.

Claims 19-20 (Canceled):

Claim 21 (New): An inverter apparatus, comprising:

a conversion unit for converting an input AC power to a DC power;

an inverter unit for converting the DC power into an output AC power having a variable frequency and a variable electric power to drive an inductor motor at a variable speed;

an excitation current detection unit for detecting an excitation current of said induction motor; and

an inverter control circuit arranged to control the variable frequency and the variable electric power of the AC power outputted from the inverter unit, said inverter control circuit comprising:

a setting unit for setting a limitation level of the excitation current;

a torque boost voltage command unit for producing a torque boost voltage command according to an inverter frequency command; and

a torque boost voltage compensation unit for compensating the torque boost voltage command, when the excitation current is equal to or larger than a predetermined value, and for generating a compensated torque boost voltage command controlled so that the excitation current value detected is smaller than or equal to said limitation level of the excitation current.

Claim 22 (New): An inverter apparatus according to Claim 21, wherein the torque boost voltage compensation unit includes a limiter processing unit arranged to process an invert of the torque boost voltage command as a lower limiter value so as to generate a compensated torque boost voltage command.

Claim 23 (New): An inverter apparatus according to Claim 21, wherein a no-load motor current is limited substantially to an excitation current limitation level when the torque boost voltage command is increased gradually in the state that the induction motor is being operated in no load.

Claim 24 (New): An inverter apparatus according to Claim 21, wherein an inverter output voltage is controlled to be substantially constant after the time when a no-load motor current reaches substantially an excitation current limitation level when the torque boost voltage command is increased gradually in the state that the induction motor is being operated in no load.

Claim 25 (New): An inverter apparatus according to Claim 21, wherein the inverter control circuit further comprises:

an integrator arrange to integrate the inverter frequency command to produce a reference phase command;

a three-phase converter arranged to generate three-phase voltage commands for a fixed coordinate axis according to coordinate axis components of the compensated torque boost voltage command, an induced voltage command and the reference phase command;

a gate signal generator arranged to prepare gate signals according to the three-phase voltage commands; and

a gate circuit arranged to drive the inverter unit according to the gate signals.

Claim 26 (New): An inverter apparatus according to Claim 25, wherein the excitation current detection unit comprises:

a signal preparation circuit including a series of logical AND gates and logical OR gates arranged to prepare the gate signals;

sample-and-hold circuits arranged to sample and hold the gate signals prepared from the signal preparation circuit; and

an arithmetic circuit arranged to perform a predetermined calculation of sampled signals on the basis of the three-phase voltage commands.